

JACG 74CE

NEWSLETTER
Vol. 5 No. 5

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THE JERSEY ATARI COMPUTER GROUP

534-6349

JACG HOTLINE

534-6349

From the Editor's
Desk...

In This Issue

The Index to Volume 4 is printed in this issue. It contains a classified listing of articles which appeared in the JACG Newsletter's twelve issues from September '84 through August '85.

If you bother to count them up you will find that there are 124 articles, all original and written by fellow JACGers. The categories are General; Software, Hardware and Printed Material Reviews; Programs and Satire. The material covered in these writings was as diverse as is our population. The quality, in my judgment, was very high. Apparently, it is also the valuation of others since we find newsletters from around the country frequently reprinting JACG material. Recently the San Leandro (CA) Computer Club printed a high quality, magazine format compendium of what they considered to be the best 33 articles published in user group newsletters last year. Out of a possible estimated 1500 to 2000 articles available, 3 of the 33 were written by JACG members Ken Pietrucha, Frank Pazel and Tom Reichard. That's a great batting average and compliment to our group!

Our newsletter averages over ten meaty articles every month plus regular columns plus cartoons. That's a very pleasant experience to have twelve times a year.

Your New Year's resolution is to be certain that your name appears at least once in the Index to Volume 5.

Frank Pazel
Editor-in-Chief, JACG Newsletter

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MARK YOUR CALENDARS!!

JACG Meeting Schedule

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February 8, 1986

March 8, 1986

April 12, 1986

May 10, 1986



NEW! 12 VOLUME ST LIBRARY



THE VIEW FROM WHITE HOUSE.

The Presidents' message.
by Bill Martin

As luck would have it, the best laid plans of mice and men.... So, I forgot! Art and Dick I'm sorry, next month for sure. My apologies for not making the motion to give you lifetime membership. Though I'm not sure if Dick will be able to show his face at the meeting again what with the thorough trouncing he received in the battle of the presidents. These guys never seem to learn their lesson when it comes to pushing around the new guy. We will continue next month with the battle of the former Presidents.

Thanks go out to Nick Scalera, part time dealer (Micro Concepts) and member of the club. Nick volunteered to handle the printer group purchase last month so what did he do? He set up another table next to his so as not to give the impression of conflict of interest and then took all the time necessary to explain the printer from his own sales time. This is the guy that helps us to set up, does frequent demos and volunteers to do jobs such as the presidency when he thinks that no one else will take it. It makes me feel guilty when I'm pressured into having to ask him to spend money for advertising beside. As far as I'm concerned that rule is for the takers, not the givers. Thanks Nick, we do appreciate you! While we're on the subject of dealers, thanks to Bob and Sarah of Gemini who donated 40 disk nibblers to the club for distribution at the December meeting. Resident V.P. "Santa" Brause distributed the goodies from a "plastic" bag. Scott's on my "SLIST" for not saving me one. Ah, for the good old days of graft and corruption! Gemini also donated the demo of the month, Atariwriter +. They have consented to do this on a continuous (read monthly) basis. Thanks also to the unknown dealer who donated a copy of E.T.. If he or she phones home or rather me, I'll give you credit next month. Thank you.

Thanks are also in order to Barry Weissman, an old friend of mine who volunteered to be International chairman. Also to Joe Kennedy who has volunteered to take over as membership chairman, an awesome task. Last, but really first, was Jim Boodleman who has volunteered to run the ST library. Now what we need is a Special Activities chairperson and a Group Purchase chairperson and we'll be on our way. We are still looking for someone to jot down the questions and (hopefully) answers for inclusion in the newsletter so if you want to help, come on down!

Special thanks to Vice President, Scott Brause who has volunteered to give a final push toward incorporation as a non-profit organization. Also to his father who has volunteered to do the legal work free. All it will cost us is the normal filing fees. We need it, now.

If you'll take a look at your newsletter label you'll note that you now have a membership number. This will be used during meetings for door prize drawings and

will eventually be placed on your membership card. Please mention it when ordering disks by mail from our library, calling the hotline or in any other club dealings.

At the meeting, I asked for some volunteers who would be willing to respond to questions on the hot line. Don Ursem has been the unofficial expert for some time now and I'd like to shift some of the weight off his shoulders. I know you are out there! HELP.

By the January meeting you should see the Executive committee name tags on display. This should help to eliminate some confusion on who's who. By the time you read this we should be pushing our new membership brochure and application. This will be mailed out on request and distributed to some of the area software dealers. It includes a map showing how to get to the meeting, an application and a description of the club. It's a professional looking piece even if I may say so myself.

It sure looks like Atari has done a bit of a turn around and come through on some of their promises. Better late (I guess) than never. First out of the chute was Atariwriter + which also supports the 130 XE. This 2 disk set without fancy documentation was favorably reviewed by Don Ursem at the December meeting. Next was the XM301 modem which we are trying to obtain for the January meeting. I'm not talking about vaporware folks. This is out and miracle of miracles, yes, I'm holding it in my hand though it hasn't reached the dealers at this writing, The Plato Learning Phone (Atari in conjunction with Control Data). Hold on to your hats because the price of this little item is under \$30.00. The kicker is that it comes with a free 1 year subscription worth \$25 and 1 hour access time worth \$7.75. Sure, a pirate can steal the cartridge and copy the documentation but why bother. It's cheaper to buy the program. Now that's what I call an innovative concept and a square deal so RUN, do not walk to your dealer when this little baby arrives. The latest rumor is that Atari is considering purchasing the rights to the Batteries Included 80 column board. Hmmm!!! While on the subject of Kudo's, how about one for member Tom Pazel (any relation to Frank Pazel?) who has produced a sharp looking piece of software that prints, alphabetizes and controls Print Shop graphics disks amongst some other features. This professional piece of software has been donated to the JACG library. Now that's what I call entertainment. Thanks Tom.

On the other side of the coin is Digital Devices of Atlanta GA, makers of the U-Print interface/buffer and the Ape Face interface. They have officially announced the availability of their graphics upgrade. The original unit was not compatible with Print Shop (Broderbund) and other popular graphics programs such as Typesetter (XLent) and they knew it. The price of this retrofit is \$35.00. They don't consider this a warranty fix and I hereby lodge my personal official protest against their policy. If something like this is allowed, what would prevent an unscrupulous producer of

hardware/software from deliberately leaving something out of a product. This could go on forever. As I see it, bad business guy's! I have a good mind to make inquiries with the state Attorney General's office to see if something can be done about it. Is there any advice out there?

More next month. As Mayor Koch says, "How am I doing?"

HOT LINE TO THE PRESIDENT. - (201) 534-6349

GIVE A BIT!!!

Contribute to the Newsletter this month.

JACG ST Library Disks

Volumes 1 - 10 courtesy of Current Notes and Joe Waters of the Washington, DC Atari User Group.

Volume 1
High Resolution Pictures

Volume 2
Color Slide Show Demo
Waterfall, Faucet, Insect, Weather Report, Explorer, Train, Trumpet, Snake
Slide Program

Volume 3
Sundog - Frozen Legacy Demo by FTL Games

Volume 4
Terminal Programs
STERM
TERM
ST-Talk (version .97 with XMODEM uploading and downloading)

Volume 5
4 X Forth Demo by the Dragon Group

Volume 6
Color Slide Show
Chaos, House, Sailboats, Rockets, Racecar, Spiral, Design 1, Design 2
Slide Program
Window Slide Program

Volume 7
Graphics Demos (color and monochrome)

Volume 8
Sample C Programs
BOB, DCOS, DROP2, DROP3, FOOLISH, FRACT1, FRACT2, FRACT3, FRACT4, MVLIN and many more
C programs written by Leonard Tramiel and Alex Leavens

Volume 9
Sample Logo Programs (color and monochrome)

Volume 10
MIDI Demo (requires a MIDI-equipped synthesizer)
Songs include Evita, Midnight In Moscow, Do You Know The Way To San Jose?, and more.

Volume 11
Sample graphics files created with DEGAS. Also includes Shopic program to display DEGAS files.
Also includes calculator program.

Volume 12
Bounce demo (like Amiga ball)
NEO-Chrome (version .5)
NEO-Chrome Manual
NEO-Chrome Quick Reference
NEO-Chrome Slide Program
NEO-Chrome Picture Files
Window Slide program

Volume 13
Chess demo
Command processor
Print program
ST-Writer Printer Configure
ST-Squeeze
ST-Unsqueeze
ST-Writer (STW80)
ST-Writer Manual
ST-Writer Quick Reference
ST-Writer Printer Driver

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EASTER EGG

A M.U.L.E.-ish
Attitude

If you need an auction plot badly enough in M.U.L.E. start the auction by holding your joystick forward. If you're flashing while the bids are being offered the plot is yours. When your bid equals your money on hand continue pressing the stick up, and the other players will be unable to outbid you. You'll get the plot, but you'll be broke!

IT'S ABOUT TIME...

THAT YOU WROTE AN
ARTICLE FOR THE
NEWSLETTER



WATOR Under the Bridge

by Patrick C. Madden, II - JACG

I guess some of you may be wondering how many more bad puns can be made on the "wator" theme. My guess is that we've only scratched the surface, and that there are many more depths to be "plumbed".

Since I first wrote about "the strange, water-covered, toroidal planet of WATOR" in the July '85 issue of the newsletter, several things have happened which are worth sharing with you. I received three responses, which is three more than I thought I'd get. The quickest response was from Charles Lichtenwalner, whose letter I received on the Monday following the July JACG meeting! Either Charles does his computer work at warp speed, or he had been working on WATOR before reading the article. Appropriately enough, Charles wrote his version of the WATOR program in ACTION!, which runs about 30 times as fast as my original BASIC version. (See the August '85 newsletter.)

I think it's safe to say that Charles's response had the largest impact on me. I was so impressed with his claims of speed that I eventually bought my own ACTION! cartridge to see for myself. He was right. Next to BASIC, ACTION! is like greased lightning. In fact, based on my recent experience with ACTION! I've essentially abandoned BASIC, at least for WATOR. (See next article, "WATOR Research")

Part of the speed advantage for ACTION! is the fact that each program is compiled before it is run. Compiled BASIC runs faster too. But there are lots of other advantages for ACTION! (and assembly languages in general). For one thing, ACTION! uses less core. In BASIC, a 35x20 array such as those used in my original WATOR uses 4200 bytes of memory; six bytes for each of 700 variables. This is because BASIC is creating enough room to store any floating point number between $9.99999999E+97$ and $-9.99999999E+97$. Most applications do not require numbers of this magnitude. In ACTION! a byte array contains one byte per variable. This is enough to store any integer between 0 and 255, and is sufficient for the arrays used in WATOR. A second advantage for ACTION! is the ability to define functions to perform specialized tasks. For example, the process of finding an empty cell to move to can be formulated into a function which operates on the current cell number and returns the cell number of an empty neighbor cell.

But one of the most interesting features I found in Charles Lichtenwalner's program is not limited to the ACTION! language. This was the way in which he controlled the screen display. In his program, a one-dimensional array called DISPL contained the ATASCII codes for the fish and shark characters he wished to display on the screen. At the end of each cycle, this array was merely loaded into memory at the location of the screen memory address (stored at addresses 88 and 89 as $PEEK(88)+256*PEEK(89)$). ACTION! does this

with one function called MOVEBLOCK but the same thing can be done in BASIC with individual POKE statements. While I haven't done it, I'm willing to bet it's much faster than position and print statements.

The second response I received was from JACGer Allan Groendyk, who flattered me by beginning his investigations of WATOR with my BASIC program. (Hope you caught my errors, Allan.) Allan also pointed out that POKE 752,1 would eliminate the "bouncing cursor" problem. I haven't heard from Allan recently, probably because he got more than a little bored with the slowness of my program. I did too--and that's the main reason I abandoned BASIC in favor of ACTION!

The third and most cerebral response came from JACGer Dan Kelly. Dan wrote a faster BASIC version of the program and then compiled it to increase speed. Dan increased speed in three ways: by structuring the program better, by changing the way it selected random directions, and by cleverly eliminating the need to zero the MOVE array each cycle. I'm sure Dan will gladly share his program with you if you are interested in obtaining it. I will only comment on a few of his changes. Instead of using the RND(0) function, Dan used PEEK(53770) which returns a random number between 0 and 255. He also "saved some steps" in the way he programmed the search for empty cells; but, this is difficult to describe without seeing the program. Finally, Dan streamlined the process of keeping track of which fish (or sharks) have recently moved. This must be done to avoid moving a fish more than once on the same cycle (or chronon). I accomplished this by establishing a "MOVE" array which would be set to "1" each time a fish moved into a new cell. During the scanning process, any cell for which $MOVE(I,J)$ was equal to 1 was skipped. Unfortunately, this made it necessary to take the time to zero the MOVE array each cycle. Dan avoided this by setting MOVE equal to the cycle counter whenever a fish was moved. This causes a cell to be skipped whenever $MOVE(I,J)$ equals the number of cycles.

But Dan's contribution didn't stop there. Like me, he allowed himself to get "hooked" on WATOR and all those idle speculations about what would happen if... Is it possible to create a system which is always stable? Yes, says Dan, and I agree; although both of us believe there is always a finite probability that any system will "crash". How do we know a system is "stable" if we only watch it for a finite period of time? Well, I guess we don't know FOR SURE, beyond the faintest whisker of a doubt. But I'll tell you what. Start out with 400 fish and 60 sharks. Let the fish breed in two cycles and the sharks in 10. Have the sharks starve in 1 cycle. Turn it on and let it go. I challenge anyone out there to watch it long enough to see it crash!

See Related Article
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DECEMBER MEETING HIGHLIGHTS

Reported by
Joseph S. Kennedy

Our new President, Bill Martin, opened the meeting with the question and answer period. After a slow start the answers started rolling in. It was noted that Silent Service as well as some of the other new Microprose games will not run on a non-Atari disk drive due to their heavy protection scheme. Bill requested a show of hands from those interested in a new SIG for programming languages. Helpers are needed for Shree Vandenberg as she attempts to audit the books. Chairpersons are needed for the following areas -

- Special events
- Membership
- International
- Group purchase

If you're interested see or call Bill. Jerry Frese has been named Director of Programs and Helene Rotondo has been named Director of Advertising. This is so that voting status at the executive meetings can be bestowed upon them. A brochure on the JACG is being produced and will be distributed to local dealers in an effort to increase our membership. Gemini Software will donate one piece of software per month that will be won by one of the members present at the meeting. A software development seminar is being planned for the spring. A volunteer is being sought to write the Q&A section of the meeting for the newsletter. Frank Pazel could use some help on the newsletter. The JACG must incorporate. Scott Brause's father has been kind enough to volunteer his services in filing the papers. Thanks Mr. Brause.

It seems that it's time for the biannual debate on newsletter mailing class. While most present felt that an increase in dues was appropriate they also felt that if anyone wanted the newsletter mailed first class they should be willing to pay a surcharge for it. To attempt to settle the issue a questionnaire will be included in January's newsletter.

Jerry Frese gave a brief talk on suggested last minute Christmas gifts for the Atari owner.

Frank Pazel is looking for an Atariwriter printer driver for the Diablo 630. Atari 800's are selling for \$70 at the Englishtown flea market. Tony Pellechio will be selling ceramic JACG mugs at the next meeting. Costa Rica has recently loosened their import restrictions for computers. We have been approached by a member of the JACG in Costa Rica to donate any old equipment for use in the schools there. If you're interested in donating anything give Frank a call. Frank showed us some of the graphics in the second Print Shop disk from JACS.

Tom Pazel demoed his program for manipulating PrintShop graphics disks. This program in BASIC with machine language

subroutines seems great and best of all Tom is donating it to the JACG library. Thanks Tom.

The BATTLE OF THE PAST PRESIDENTS turned out to be the battle of one past and one present as Art wasn't at the meeting today. In fact the battle was rescued from being a minor skirmish by one of our younger members. Talk about trying out a program without reading the directions!

Richard Lamb and his son, Brian, demoed several of the machine language programs from the library including Popcorn and Elevator.

Don Ursem demoed the new Atariwriter+. The most impressive features is the ability to edit the document while in the wide preview mode. What you see (and now what you type) is what you get. The formats are also not embedded in the text any more and can be globally set at each session. This piece of software was donated by Gemini and was given away at the end of the meeting.

Professor Dick Kushner, fresh from his undersea battles with Commandante Martin, gave us a brief astronomy lesson on comets as his lead-in to demo The Halley Project. In the Halley Project you rocket throughout the solar system on missions from your base on the Comet Halley. Dick felt that while you could learn a little about the stars from this program your money would be better spent on a pair of binoculars to view the real comet.

Robert Dennis demoed the program Karateka from Broderbund. This program has to be seen to be believed, The graphics are fantastic.

GIVE A BIT!!

"Quick! Input your access code!!"



**HAVE YOU RENEWED
YOUR MEMBERSHIP?**

**CHECK YOUR MAILING LABEL
FOR MEMBERSHIP EXPIRATION DATE**

The Mathematics of Mathematics (3)

Copyright 1985 Donald Forbes - JACG

Confused by mathematics? Create your own model! You may still be ignorant, but you will never again be confused.

Do you want to be a mathematician's mathematician?

Are you a mathematical specialist who aspires to be a generalist?

Are you a talented amateur who would like to know what the "queen of the sciences" has to tell?

Mathematics has been in use since early antiquity. Because the basis of the civilizations in the river valleys of the ancient world was agriculture, the administrators first had to control watering systems through irrigation, drainage, pumping, and canalization. Secondly, they had to measure land and harvests for tax collection. Thirdly, they had to establish a calendar by observation of the heavenly bodies. All of these tasks demanded some knowledge of mathematics.

Baron Joseph Fourier (1768-1830) has been immortalized in mathematics by his statement (without rigorous proof) that an arbitrary function could be represented by trigonometric series.

In 1822, in his paper on the 'Analytic Theory of Heat,' he wrote: "There cannot be a language more universal and more simple, more free from errors and obscurities...more worthy to express the invariable relations of natural things [than mathematics]. It interprets [all phenomena] by the same language, as if to attest to the unity and simplicity of the plan of the universe, and to make still more evident that unchangeable order which presides over all natural causes."

Toward the end of the 1800s, the subjects of mathematical research became highly differentiated. Branches were further ramified into more specialized branches, while unexpected relations were found between previously unconnected fields. The situation became so complicated that it was difficult to view mathematics as a whole. In 1898 a project was started in Berlin and Vienna to compile an encyclopedia of the mathematical sciences. The 'Enzyklopadie der mathematischen Wissenschaften' was completed in 20 years and it provided a useful overview of the mathematics of the 19th century.

Toward the end of the century, the International Congress of Mathematicians (ICM) was established to foster communication among mathematicians from all parts of the world. Meetings have since been held (with some interruptions) at four-year intervals. The next meeting is scheduled for August 3-11, 1986 in Berkeley, California. (If you propose to present a paper, the deadline for abstracts is April 8.)

A more convenient path to an overview of professional mathematics today might be a study of the English translation of the 'Encyclopedic Dictionary of Mathematics' by the Mathematical Society of Japan published in 1980 in two huge paperback volumes by the MIT Press.

Saunders Mac Lane, president in 1973-1974 of the American Mathematical Society, noted that "this was an encyclopedia that

contained effective and penetrating information about all the fields of advanced mathematical research. We were also frustrated because we could not read Japanese and so we could not really reach out to this expert and effective source of information...We look forward to the fascination which we can now have in getting at this rich mine of information."

Before tackling this source, we need a framework for our studies. Roger Bacon, I believe, remarked that we learn more from error than from confusion.

The history of mathematics has been a series of crises and unfoldings. Howard Eves and Carroll Newsom in their book on the history and foundations of mathematics take note of three profound and disturbing crises. The first was the Pythagorean discovery that the diagonal and side of a square have no common unit of measure. The second crisis lasted until Newton's infinitesimals were replaced by Cauchy by the method of limits. The third crisis arose from the paradoxes or contradictions involving sets that were members of themselves. (If the barber in the town shaves all townspeople who do not shave themselves, who shaves the barber? You can't hedge with: The barber is a woman!)

We can create a simple model of abstract mathematics with a four-by-four set of pigeonholes to hold the chronological advances as follows (with the slots numbered in hexadecimal order--and geometry in the eight center columns, algebra in the eight center rows, analysis in the top half, and topology in the right half):

```

+---+---+---+---+
| 4 | 5 | D | C |
+---+---+---+---+
| 6 | 7 | F | E |
+---+---+---+---+
| 2 | 3 | B | A |
+---+---+---+---+
| 0 | 1 | 9 | 8 |
+---+---+---+---+

```

What shall we take as the subject matter of mathematics? One easy beginning is the chapter headings of Morris Kline's monumental history of 'Mathematical Thought from Ancient to Modern Times.' He covers these topics in about this order: geometry and trigonometry, arithmetic and algebra, projective geometry, coordinate geometry, creation of the calculus, calculus, infinite series, differential equations, partial differential equations, analytic and differential geometry, calculus of variations, algebra, functions of a complex variable, Galois theory, quaternions, vectors and linear associative algebras, determinants and matrices, theory of numbers, projective geometry, non-Euclidean geometry, differential geometry, projective and metric geometry, algebraic geometry, the instillation of rigor in analysis, foundations of the real and transfinite numbers, foundations of geometry, functions of real variables, integral equations, functional analysis, divergent series, tensor analysis and differential geometry, abstract algebra, topology, and the foundations of mathematics.

Since we have seen that mathematics advances by a series of unfoldings, let us

attempt to allocate these topics into their appropriate slots. We use the 0 slot for logic and foundations; the first unfolding occurred with Euclid's geometry, which belongs in slot 1. We start with:

+-----+-----+	
Foundations	Geometry and
of	trigonometry.
mathematics.	Projective
	geometry.
	Non-euclidean
	geometry.
	Metric
	geometry.
	Foundations
0	of geometry. 1
+-----+-----+	

The next unfolding adds algebra to mathematics. Here we insert algebra (slot 2). Descartes came at the right time. Greek mathematics had reached a dead end; enormously complicated geometric representations were needed to solve what were essentially algebraic problems. Descartes' algebraic geometry opens up slot 3.

+-----+-----+	
Arithmetic	Coordinate
and algebra.	geometry.
Galois theory.	Analytic
Theory of	geometry.
numbers.	Quaternions,
	vectors and
	linear associa-
	tive algebras.
	Determinants
	and matrices.
	Algebraic
2	geometry. 3
+-----+-----+	

Invention of the calculus brings a new unfolding and doubles the number of slots to four. Here are slots 4 and 5:

+-----+-----+	
Creation of	Differential
the calculus.	geometry.
Instillation	
of rigor in	
analysis. 4	5
+-----+-----+	

The confluence of analysis and algebra gives us slot 6, and the addition of geometry provides slot 7:

+-----+-----+	
Infinite	Calculus of
series.	variations.
Ordinary	Functions of
differential	a complex
equations.	variable.
Partial	Functions
differential	of real
equations.	variables.
Divergent	Tensor
series. 6	analysis. 7
+-----+-----+	

The invention of set theory and the development of the topology of point sets and general topology creates a new unfolding which adds another eight slots to the existing eight, thus giving us sixteen in all.

In slot 8 we place "Foundations of the real and transfinite numbers. Topology." In Slot 10 (or A) we place "Abstract algebra." In slot 14 (or E) we place "Integral equations." Lastly, in slot 15 (or F) we place "Functional analysis."

We still have some empty slots. What belongs in them? This is a question we will answer in due course.

We have, however, now accomplished what we set out to do: present a unified view of abstract mathematics as a whole. As long as we can classify the topics of mathematics in their appropriate boxes, and relate them to one another and to the whole, then we need never be confused again. Ignorant perhaps, but confused? Never!



IT HAPPENED: LIGHTNING KILLED

A JAGG member lost a Hayes Modem,
an Atari 850, and a Prowriter
printer. Could you afford those \$?

YOU NEED PHONE LINE PROTECTION!!

BUY the BEST, TA-3.

The TA-3, with Spark-Gap & Varistor
control, for "state-of-the-art"
LIGHTNING PROTECTION!

The other look-a-likes are much
less, usually ONLY Spark-Gaps.

This is static cling season.
Static cling can do you in.
Kids touch your open joystick port
with a static charge on their body
and ZAP goes your computer.

Next are Spring Lightning Boomers.
Then Summer Hurricane Lightning.
There is little safe time.

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GENERAL

TITLE	AUTHOR	ISSUE/PG#
Taricon '84	R. Kushner	1/3
Forth: A Race Against the Clock	D. Forbes	1/10
Atari & Taricon	R. Kushner	1/12
Tracing Colon Definitions	D. Forbes	1/19
Plu-Perfect	R. Reaser	1/22
Cellular Automata	K. McDonald	1/24
What Language Does Your Atari Speak?	A. Leyenberger	2/4
Number Crunching in Forth	K. Pietrucha	2/11
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The Graphics Tablet	M. Pederson	3/6
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Drive a Printer	J. Miller	7/9
Atari Users in Japan	W. Brandt	7/9
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The Literature of Forth - Part III	D. Forbes	8/6
Leaf Storm	K. McDonald	8/8
Computers in Schools	W. Brooks	8/13
The Power of Forth	D. Forbes	8/20
Structured Atari BASIC	G. Hampton	8/24
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LIGHTNING Or Bye-Bye Bytes

by S. Cory - JACG

Have you heard of the silent killer?

Computers, modems, interfaces, printers, phones, and most modern solid state devices have theirs - transients. Transients can be categorized as abrupt energy shifts having numerous names; spikes, surges, droops and electrostatic discharge to name a few. We are quite familiar with that surprise ZAP from a door knob, the snap of static cling, or lightning flashes. These obvious forms are equally deadly as are the silent killers, phone and power line transients, to modern high density integrated circuits. One of the major effects of a nuclear war will be the immediate loss of the unhardened communications in the US due to immense voltage pulses. That means no phones, TV or radio. The silent world will be upon us.

In the normal operation of our life transients are under decent control. For example, how little news of power transients is generated reflects the very hard work done by dedicated engineers who have fought to reduce a once major problem to a now acceptable risk. Unfortunately, the acceptable risk is assumed by you the consumer of our power and phone suppliers. Do not blame them for they have done well up to where they terminate at your dwelling. Any real protection solution has to be yours. When you bought your phone and computer system did the electronic guts sell them or was it appearance, price and performance?

Witness the recent thunderstorm strike at JACG BBS: at least \$5,000 loss; much embarrassment; and from December meeting reports still without a hard disk back for the third time to the manufacturer. When it comes back, as is usual with complicated electronics, no one ever will be sure of its performance or what parts have been weakened to future failure. Another case; our intrepid Newsletter Editor, Frank Pazel, had disconnected all power lines but forgot the phone line. ZAP! Down went a modem, an interface, and a printer. Other clubs have reported similar events. Recently, a news item reported a large modem manufacturer stated 90% of modem repairs could be traced to a transient problem.

Mother Nature is unstoppable. Man has no even near perfect defense. At best, the traditional devices such as spark-gaps, carbon rods, RC, LC, and RLC circuits by themselves do a pedestrian job. Back to back zener circuits do much better. Teaming produces improved results. The new kid on the block, the varistor, is a clear improvement offering state of the art protection. When applied properly to power lines with the packaged line filters most transients are readily controlled through dissipation to UL approved ground. Equally true is its dramatic results when applied to phone lines. The consumer is now offered several packages. Most only employ spark-gaps at about \$20. The better employ spark-gaps and back to back zeners (\$30).

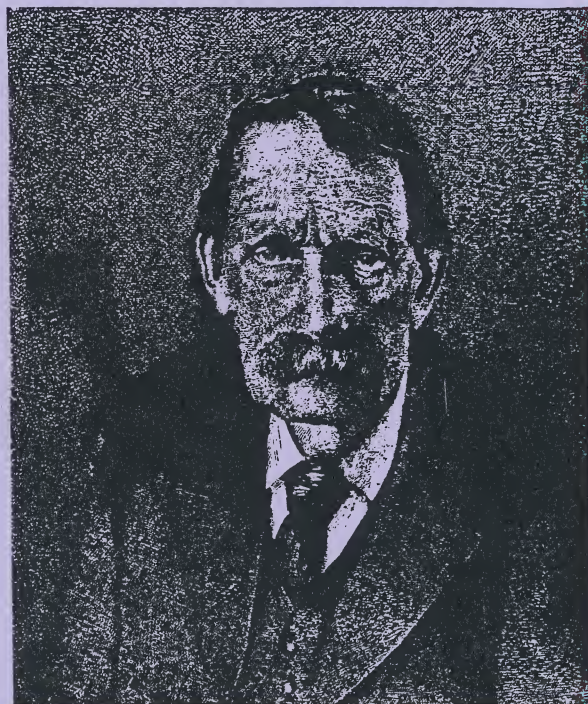
The present best team spark-gaps with varistors(\$30) for protection so fast (nanoseconds) your phone or modem are safe and protected for a majority of events. The TA-3 Surge Protector manufactured by Towaco Associates is a unit which employs this state-of-the-art design.

Be careful! Keyboards are an open line to your computer innards. Thankfully, most are adequately designed and resist transients well through barriers and ground paths. How well they resist after a pair of hands and a solder iron get through lies in the laps of the gods.

Remember, we are daily experiencing voltages with their resulting induced effects. It takes 20,000 volts to jump a one inch atmospheric ground level gap. Think, in a thunderstorm, what the voltage difference can be just from your feet to your head let alone to the clouds. Let's see; 20,000 times 72" or 20,000 times 12" times 2,000'. The first number is you; the second number is lightning. We are all subject to these values either on the golf course or in the house. This includes those antennas we call power and telephone lines. And ZAP into your computer or phone!

All hope is not lost. Buy power and phone line protection. Or unplug everything just before surge events occur. Don't forget to tie grounds to your hands and body before using the computer during a storm. Wear only natural fibers. Don't touch your equipment. Don't buy any equipment. Last of all-Don't forget to do something. Please don't. Don't.

The best of all to you for 1986.



**I DON'T BELIEVE I LET MY
J.A.C.G. MEMBERSHIP RUN OUT!**

Byte-sized Programming by Tom Pazel - JACG

As promised, I am going to show how to load/save a screen from BASIC using Central Input/Output, CIO for short. In case you don't have your copy of last month's newsletter handy, here is the program that appeared:

```
10 GRAPHICS 8+16
20 REM Find screen RAM
30 SCRN=PEEK(88)+256*PEEK(89)
40 REM OPEN file for input
50 OPEN #1,4,0,"D:MYPIC"
60 REM Bring those bytes back
70 FOR I=SCRN TO SCRN+7679
80 GET #1,BYTE:POKE I,BYTE
90 NEXT I
100 CLOSE #1
110 REM There's your screen!
```

I had mentioned that, although this program does the job, the I/O portion is quite slow. CIO comes in very handy when you want to speed up any data transfer in a program. In order to understand what is to follow, a bit (sorry) about Input Output Control Blocks (IOCB) is in order.

An IOCB is nothing more than a 16 byte chunk of memory set aside for a specific purpose. That purpose is to communicate data to the Operating System in order to tell the computer/peripherals what kind of I/O is desired (OPEN a file, GET a byte, PUT a byte, etc.). There are 8 IOCBs, numbered from 0-7. They are all at the same place in memory in every 8-bit ATARI. The following table summarizes this:

IOCB	Address Range
0	\$340-\$34F
1	\$350-\$35F
2	\$360-\$36F
3	\$370-\$37F
4	\$380-\$38F
5	\$390-\$39F
6	\$3A0-\$3AF
7	\$3B0-\$3BF

You use them all the time, though you may not know it. Whenever you are typing a BASIC program, you are using IOCB 0 (for the Editor). SAVE, LOAD and RUN commands use IOCB 7 for the I/O. Does this look familiar:

? #6;"BIG TEXT"

The "#6" means use IOCB 6. IOCBs 0,6 and 7 should normally NOT be used in your programs, since they have other pre-defined purposes. However, IOCBs 1,2,3,4 and 5 are always available to do with as you please. Each IOCB is in the same format, so let's quickly examine one so you can see how they work.

The first thing you set in the IOCB is the command you want:

Command	Value in IOCB
OPEN	3
CLOSE	12
GET bytes	7
PUT bytes	11
GET record	5
PUT record	9

This value is placed in the third byte of the IOCB. The next thing to set in the IOCB is where is the data coming from/going to in memory. This is done by placing the Least Significant Byte of the address into the fifth byte and the Most Significant Byte of the address into the sixth byte of the IOCB. Next, tell the computer how much data is involved here by placing the Least Significant Byte of the length of the data into the ninth byte and the Most Significant Byte of the length into the tenth byte of the IOCB. Lastly, call CIO to do the job. Sounds like it's not worth the effort, doesn't it? Well, it is. Our example program this month should help clear things up:

```
10 GRAPHICS 8+16
20 IOCB1=848
30 FOR I=1536 TO 1541
32 READ ML
34 POKE I,ML
36 NEXT I
38 DATA 104,162,16,76,86,228
40 REM OPEN file for input
50 OPEN #1,4,0,"D:MYPIC"
60 REM Bring those bytes back
70 POKE IOCB1+2,7
80 POKE IOCB1+4,PEEK(88)
82 POKE IOCB1+5,PEEK(89)
84 POKE IOCB1+8,0
86 POKE IOCB1+9,30
90 I=USR(1536)
100 CLOSE #1
110 REM There's your screen!
```

If you use this listing as a reference and go back through the article, I think you'll see what is happening. However, in case you don't, here is a line-by-line explanation:

Line 10 is the same as before. We have to have the screen set up in the proper mode before a picture can be returned to it.

Line 20 is for convenience only so we can get at IOCB 1 a little easier. The 848 is the starting address of the IOCB in decimal.

Lines 30-36 READ the DATA in line 38 and POKE it into the front of page 6 (1536-1541). This DATA is a machine language routine necessary to call CIO from BASIC. It translates to a PLA instruction, LDX #16, followed by a JMP \$E456 (CIO). It is not essential to understand this. Just use the 6 numbers given whenever you want to call CIO. Change the "16" to the IOCB number times 16 (32 for IOCB 2, 48 for IOCB 3, etc.).

Lines 40-60 are the same as before. The picture file is OPENed for input using IOCB #1.

Line 70 sets up the command byte as a 7 which means GET bytes. Use 11 for PUT bytes (to save a screen).

Lines 80-82 sets up the buffer address to place the data we're about to GET. Notice that I have told the IOCB to place the data into screen memory. (Refer to the listing at the beginning of the column).

Lines 84-86 tell CIO how many bytes to transfer. Since this is a GRAPHICS 8 screen, we want 7680 bytes. $(30 * 256) + 0 = 7680$.

Line 90 finally calls CIO to do what we've asked (GET 7680 bytes from IOCB 1 and put them into screen memory).

Lines 100-110 are the same as before.

I hope the explanation and example have helped you understand the powerful I/O system the ATARI computers have within them.

Happy New Year!

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JACG Robotics SIG
Welcome Wagon Report

This is the first of a series of reports to keep JACG members up to date on what has been happening in the Robotics SIG. The effort to organize a Robotics SIG was started this past summer; however, the first meeting was not held until September. There have been four meetings so far, and almost twenty people have expressed an interest in joining the group. Until a more permanent meeting place can be found, the group has been meeting once a month in the lobby of the auditorium after the regular JACG meeting is over.

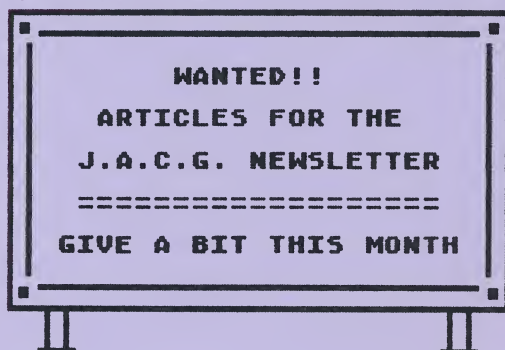
Since the SIG has just started, a lot of time has been spent in talking about what the group should do. The consensus has been that the prime function of the group will be to help people interested in robotics get together to share information and exchange ideas. Most of the members are relatively inexperienced in the area of robotics and see the SIG as a way of learning about robotics and getting experience in this area. Another suggestion has been for the group to work on a robotics project which would eventually end up as a presentation at a regular JACG meeting. The intent would be to show JACG members how to build a simple robotics device and to provide examples of how to write programs to control it. This might take the form of a moving platform or robot arm which would be controlled through the computer joystick port.

The group has also started its own newsletter which has been used to keep the members up to date on what has been happening at the meetings and to distribute information on robotics hardware and software. Any items of general interest will also be repeated as a Robotics SIG article in the regular JACG Newsletter.

If you are interested in joining the Robotics SIG, simply come to one of the meetings, or contact Sam Cory, the meetings chairman, or Bill Brandt, the newsletter editor.

Sam Cory
18 Pinebrook Road, P.O. Box 7
Towaco, New Jersey 07082

W. E. Brandt
27 Mohawk Trail
Westfield, New Jersey 07090



I FINALLY FOUND A USE FOR THE COMPUTER IN THE CLASSROOM.



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Help! Needs PILOT

5 Dec. 1985

Apartado 1
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Costa Rica

I am a member of JACG and I am trying to set up Atari computers for educational use here in Costa Rica. Once I've gotten a set-up together it will be given to a public school. To do this I need a bit of help.

1. I need to be lent a manual for Atari PILOT. It will be returned after learning it (very soon).

2. I need any used Atari or Atari compatible equipment that can be spared. Operating equipment would be used as is and inoperative equipment would be cannibalized for parts or repaired. Please contact me before sending anything.

Costa Rica has just removed all import duties from computers and, as a result, computing is booming here. There are thousands of kids in backwoods schools who have never seen a computer. I want to "Atari-ize" a couple of these schools.

Your help will be greatly appreciated.

Sincerely,

Roy Lent

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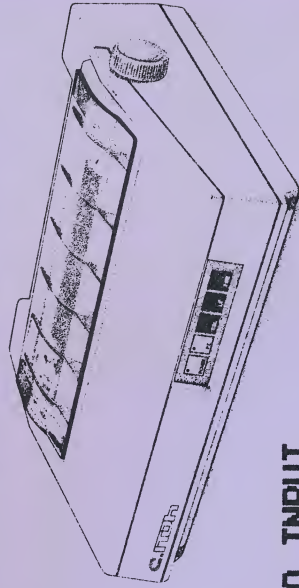
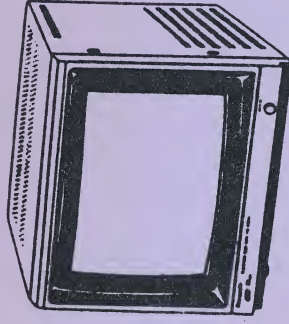
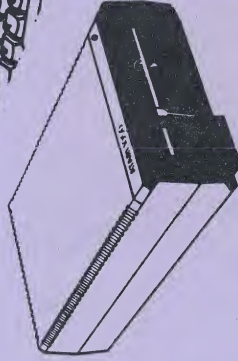
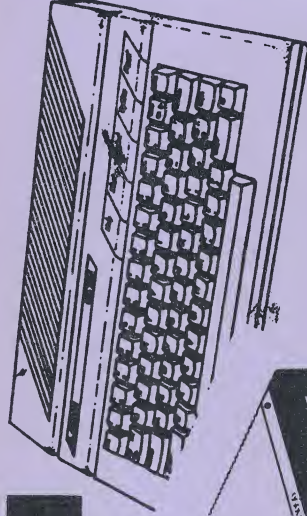
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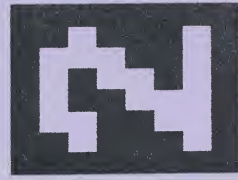
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THE JULIAN DAY

by Kenneth J. Pietrucha - JACG

I am not interested in the visual aspect of astronomy, but I must confess that the precision which goes into its calculations hold a certain fascination for me. As a case in point, I offer the history and program for calculating the Julian Day.

The world has gone through a great many calendars since man decided to mark time. Astronomers, mindful of this confusion, have a reference all their own, the Julian Day. The calculation which gives the number of days since January 1, 4713 B.C. at noon, was introduced by Joseph Scaliger in the year 1582. The Julian period, which will last 7980 years, has no relation to Julius Ceaser or the Julian Calendar, but was named by Joseph Scaliger for his father, Julius. How Joseph picked the starting date of this period, considering the year was 1582, is fascinating in itself.

First he calculated the solar cycle, or that period of time when January 1 falls on a Sunday. This works out to be twenty-eight Julian years.

Next he calculated the lunar cycle or the time that brings the full moon back to the same day of the year, which comes to nineteen Julian years.

The last cycle known as the Roman Indication seems to be something like the oriental lunar calendar and rotates every fifteen years.

When all three were in step, and the full moon fell on Sunday January 1, the calculated year was 4713 B.C., the start of the Julian Period.

The period was started at noon so that astronomers would not have to adjust their calendar in the middle of a night's work.

The program I have written uses procedures from the book Practical Astronomy with your Calculator by Peter Duffett-Smith.

To calculate the number of days between any two events, enter the first date and record its Julian day number. Then calculate the Julian day for the second date and then subtract the two Julian days. You will now have the number of days between the two dates. Now try calculating the number of days between these two dates using the method of "Thirty days has September". Most people make a mistake somewhere.

One note of interest, the Julian day numbers are very large. As I write this article, 2446408.5 days have passed since the EPOCH which began on January 1, 4713 B.C.

```
2 REM CALCULATES THE JULIAN DAY NUMBER
3 REM SINCE MID-DAY OF JAN.1, 4713 BC
4 REM BY KENNETH J. PIETRUCHA J.A.C.G.
5 REM DEC.9, 1985 ***JD #2446408.5**
6 REM REFERENCE-PRACTICAL ASTRONOMY
7 REM WITH YOUR CALCULATOR**PETER
  DUFFET-SMITH
```

```
10 GRAPHICS 0
20 ? "JULIAN DAY NUMBER, FOR WHAT
  YEAR";:INPUT Y
30 ? "WHAT MONTH(NUMBER)";:INPUT M
40 ? "WHAT DAY(NUMBER)";:INPUT D
50 IF M=1 OR M=2 THEN LET Y=Y-1:M=M+12
60 A=INT(Y/100)
70 B=2-A+INT(A/4)
80 C=INT(365.25*Y)
90 E=INT(30.6001*(M+1))
100 JD=B+C+E+D+1720994.5
110 ? "JULIAN DAY NUMBER ";JD
```

Additionally, the 1986 Farmer's Almanac lists the current solar cycle as 6, the lunar cycle as 11 and the Roman Indication as 9. We are now (1986) in the 6699 year of the Julian Period.

If anyone can supply me with a better definition of the Roman Indication, I would appreciate hearing from you.




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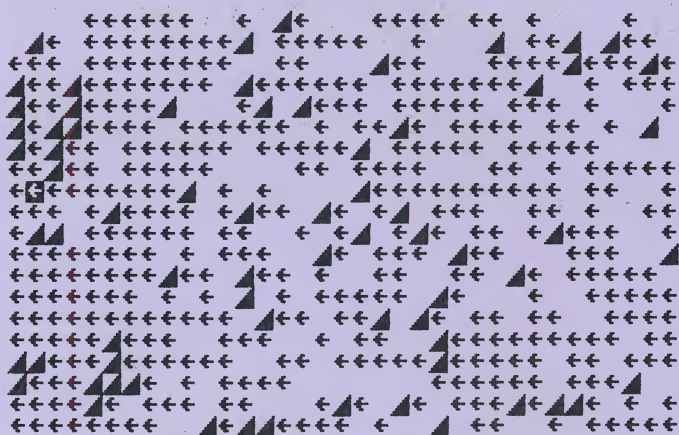
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WATOR Research
by Patrick C. Madden, II - JACG

One of the reasons it took me so long to write a followup article on WATOR is that I wanted to say something significant about it (as if staring at little sharks and fish gyrating on your monitor could ever be considered "significant"). Well, the time has come. I have something significant to say. And I'll be surprised if it doesn't turn on at least a few of you closet recreational mathematicians out there.

It all started with my personal quest for speed. As chronicled in the previous article (WATOR Under the Bridge), I became disillusioned with the slowness of my original BASIC program shortly after writing it. This was partly due to Charles Lichtenwalner's ACTION! program which first came to my attention two days after my BASIC version was published. However, I delayed several months before purchasing an ACTION! cartridge because learning a new language seemed like so much work (I wasn't wrong). In the meantime, Dan Kelly sent me a stability analysis he had done on the WATOR system. This was getting serious! Dan suggested plotting the number of sharks vs the number of fish and describing the performance of a given system in terms of the periodic "cycles" in fish and shark populations. This stimulated my thinking on the subject. I decided that what we needed was a program that kept track of the number of sharks and fish rather than their positions. What I finally settled on is the program listed below--a graphics program which plots the number of fish versus the number of sharks on a graphics 8 screen.

Before describing the program and some of the results I've seen, let's discuss a few groundrules. For a system as "simple" as WATOR is, it is surprising how many variations on the theme are possible. To clarify things, I would like to propose some basic guidelines we should all follow to achieve consistency. And I must apologize for changing my mind on a few parameters since publishing my first version.



FISH 400 SHARKS 60 CYCLES 0

First let's consider the ocean. I originally proposed a 35x20 grid because some of my early attempts to program in

BASIC with a 40x20 grid ran into core limitations. Since then, the program has been streamlined enough to allow a larger grid. A 40x20 grid was used by Charles Lichtenwalner in his ACTION! version and I propose we adopt that size as our permanent basis.

Another aspect of the original WATOR that I abandoned in favor of greater speed was its toroidal shape. Upon reflection, I regret that esthetic error. My problem was the extra statements required to provide "wraparound" of the screen display. Again, Charles Lichtenwalner provided an easy solution. Since ACTION! doesn't allow two-dimensional arrays anyway, he used 800 variable one-dimensional arrays. Determining a cell's neighbor cells was easy; simply add 1, -1, 40, or -40 to the current cell number. (Actually, I used 799 and 760 instead of -1 and -40 since ACTION! didn't seem to accept negative values in the NGHBR array.) Notice that this automatically takes care of horizontal wraparound. Vertical wraparound is easily taken care of with a single statement which subtracts 800 from the cell number if it is greater than 800.

While we're on the subject of esthetics, there's one quality about the old system I didn't like from the start and I suggest we abandon. This is the lock-step way in which all descendants of a given fish reproduce at the same time. This is especially annoying if the system comes close to crashing and then recovers. Often one observes the whole school of fish suddenly double in size in a most unnatural fashion. What I propose is to randomize the breeding age of the "mother" fish after her first baby. I realize this changes the meaning of breeding time. This feature will, on average, cause fish to breed about twice as often after the first offspring; but I'm willing to sacrifice for the esthetics.

One final point I'd like to make concerns the relationship between shark breeding time and starving time. Obviously, if one gives sharks a breeding time less than their starving time they can achieve a form of collective immortality by reproducing before they starve. The most effective safeguard against this I could think of is to require that the sharks eat at least once before they reproduce. In programming language this means simply that SHARK(cell) > SHARKEAT(cell). With that check, one can be free to explore any combination of starve times and breed times for sharks.

That ends the groundrules I wanted to discuss here. Before going on, I should mention that my experience with Charles Lichtenwalner's program was not all positive. Soon after I began running it I discovered some errors. First, in Charles's LOADFISH and LOADSHARK routines he inadvertently loaded the fish into a 1600 cell array, but later only called upon 800 of those cells. Thus, on average only about half the fish and sharks specified got initialized. Second, Charles made no checks to see if the cell randomly selected during

the initialization process was already occupied. Thus some of the fish and sharks could disappear if another fish were loaded into the same cell. These errors are corrected in my ACTION! routines listed below. It's not too surprising that these errors went unnoticed, since the program is so fast you have to be very quick to catch the initial printout of the number of fish and sharks.

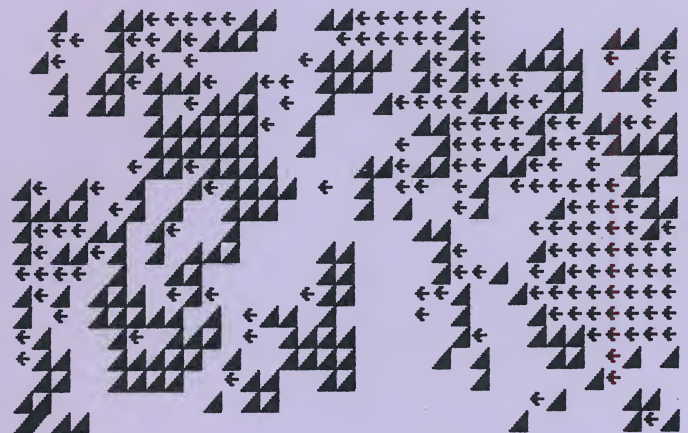
Now to my program. As I mentioned earlier, It does not display the location of the fish and sharks, but merely plots their number on a triangular sharks vs fish graph. The "fun" of this plot is watching the fish and sharks cycle semi-randomly up and down with time. The fish are plotted on the abscissa while the sharks are plotted on the ordinate.

Considering that a random number generator is making all the decisions here, this system marks out some rather regular cycles. You should be able to tell, just by thinking about it, whether these cycles move clockwise or counterclockwise. (Oh yes, I refer to these meanderings as "cycles", preferring to measure time in "chronons".) The program does not wait until the end of a chronon when all the fish and sharks have moved, but plots a new point each time a new number of fish or sharks is reached. Not all these points show up uniquely, however, since the graphics 8 screen is only 160x320 pixels. Nonetheless, the graphics display is quite interesting, and essentially independent of the starting number of sharks and fish. The location, size, and shape of the stable region is only a function of the three parameters, FISHAGE, SHARKAGE, and SHARKSTARVE. (These were called FBREED, SBREED, and STARVE in my original BASIC program.)

One of the most interesting things about WATOR is the wide ranges in fish and shark populations which occur routinely in "stable" systems. One example is a system discovered by Dan Kelly in which FISHAGE=2, SHARKAGE=10, and SHARKSTARVE=1. In the dozens of times I've run this "2:10:1" system, it has never "crashed", and on one occasion was still going strong when I shut it off after 23,700 chronons! Yet at various times, the fish population can be as high as 760 or as low as 60. The sharks range from 10 to 210. And it's pretty much the same story each time I run it. The shape of the stable region is roughly triangular, with rounded corners. The base of the triangle is a relatively straight line along which the fish increase from roughly 70 to about 760 at an almost constant shark population of 10-15. The "hypotenuse" of the triangle is really a curve along which the shark population increases as fish decrease. About three fish are eaten for each additional shark. (Is this a cause or an effect?) The last leg of the triangle is formed when the fish population reaches about 80 and the shark population dives from about 200 to 10 at essentially constant fish. Of course that's just the outer rim of the triangle. After a thousand chronons or so, the interior of the triangle is essentially filled with points.

What if sharks are allowed to breed in 5 rather than 10 chronons? This 2:5:1 system looks similar, except that the fish now never get above about 670. The top part of the region is more rounded and the fish don't get below the 80-100 range. The sharks still peak at about 200 but their low point doesn't get below about 20, probably because they reproduce faster.

I've tried a few other systems, but haven't really studied enough types to draw general conclusions. The 3:5:3 system is often unstable (all fish or dead world in <100 chronons) but sometimes survives nicely. When it does, the shark range is 50-250; the fish range is 100-630. The 3:5:2 world seems to work a little better, but just barely survives its first cycle, which is about 35 chronons. Fish drop to about 10 while sharks drop to 2 before the world recovers to more reasonable levels. There are some systems that never seem to work, but they die interesting deaths. Obviously, the starting number of fish/sharks can strongly affect the survival of a given system. However, once the system gets going, any of the hundreds of points passed along the way can be considered a new starting point. (The first day of the rest of their lives.)



FISH 226 SHARKS 206 CYCLES 6

Actually, that last statement is not quite accurate. Starting with 200 fish and 100 sharks is not the same as passing through that point after a few hundred chronons. The reason is that the world behaves differently in the beginning than it does later on. In the beginning, the fish are more randomly distributed, whereas later on, they have a tendency to cluster. Basically, they can't get very far before reproducing if breeding time is less than three chronons. There's lots to explore here, for someone who's got the time and the inclination.

I've gotten somewhat interested in what I call the "self-starting" world. A self-starting world is one capable of starting with one shark and one fish. I haven't found one yet. The shark must have a starve time long enough for the fish to populate the grid but short enough not to dominate the ocean later and eat all the fish. I think it may be impossible. What do you think?

The questions go on and on. A friend of mine suggested that WATOR really needed fishermen to thin out the fish population. OK I said, but do they use baited hooks to pull them out one at a time or do they use nets? What about shark hunters? And why not let the sharks eat each other when the fish are gone? (Could that work?) Fish diseases, smart fish, smart sharks, the list is endless. All of which goes to show that the real world is a lot more complex than anything we can simulate on a 64K computer. Still it's fun sometimes to see what you can do with three parameters and a random number generator. If you find something interesting, drop me a line at:

Pat Madden
10793 Sandringham
Baton Rouge, La. 70815

```
; WATOR RESEARCH PROGRAM
; BY P. C. MADDEN 11/30/85
```

```
BYTE ARRAY FISH(800),SHARK(800),
            SHARKEAT(800)
CARD ARRAY NGHBR=[760 799 1 40],
            MOVE(800)
CARD SCREEN,CHRONONS=[0],
            NUMFISH=[200],NUMSHARK=[100]
BYTE FISHAGE=[3],SHARKAGE=[5],
            SHARKSTARVE=[3],STOP=[1]
```

```
PROC INITGR() ; SET UP GRAPHICS PLOT
GRAPHICS(8) COLOR=1
ZERO(MOVE,800)
PLOT(0,0) DRAWTO(0,15) DRAWTO(4,15)
DRAWTO(0,15) DRAWTO(0,51) DRAWTO(4,51)
DRAWTO(0,51) DRAWTO(0,87) DRAWTO(4,87)
DRAWTO(0,87) DRAWTO(0,123) DRAWTO(4,123)
DRAWTO(0,123) DRAWTO(0,159)
DRAWTO(39,159) DRAWTO(39,155) DRAWTO(39,159)
DRAWTO(79,159) DRAWTO(79,155) DRAWTO(79,159)
DRAWTO(119,159) DRAWTO(119,155) DRAWTO(119,159)
DRAWTO(159,159) DRAWTO(159,155) DRAWTO(159,159)
DRAWTO(199,159) DRAWTO(199,155) DRAWTO(199,159)
DRAWTO(239,159) DRAWTO(239,155) DRAWTO(239,159)
DRAWTO(279,159) DRAWTO(279,155) DRAWTO(279,159)
DRAWTO(319,159) DRAWTO(159,15)
RETURN
```

```
PROC WAIT()
;PUT COMPUTER ON HOLD AT END OF GAME
```

```
PROC LOADFISH()
;RANDOMLY DISTRIBUTES FISH INTO FISH ARRAY
```

```
INT I,CELL
;EMPTY CELLS GIVEN VALUE OF 255
SETBLOCK(FISH,800,255)
I=0
DO
CELL=RAND(20)*40+RAND(40)
IF FISH(CELL)=255 THEN
;RANDOMIZE AGE DISTRIBUTION
FISH(CELL)=RAND(FISHAGE)
I=I+1
FI ;END OF "IF"
UNTIL I=NUMFISH
OD ;END OF "DO LOOP"
RETURN
```

```
PROC LOADSHARK()
;RANDOMLY DISTRIBUTES SHARKS INTO SHARK ARRAY
```

```
INT I,CELL
SETBLOCK(SHARK,800,255)
```

```
SETBLOCK(SHARKEAT,800,0)
I=0
DO
CELL=RAND(20)*40+RAND(40)
IF FISH(CELL)=255 AND
SHARK(CELL)=255 THEN
SHARK(CELL)=RAND(SHARKAGE)
SHARKEAT(CELL)=RAND(SHARKSTARVE)
I=I+1
FI
UNTIL I=NUMSHARK
OD
RETURN
```

```
INT FUNC ADJCELL(INT CELL,NGHBR)
;PROVIDES FOR SCREEN WRAPAROUND
```

```
INT CPN
CPN=CELL+NGHBR
IF CPN>799 THEN RETURN (CPN-800)
ELSE RETURN (CPN)
FI
```

```
INT FUNC FINDMTCELL(INT CELL)
;RANDOMLY SELECTS EMPTY NEIGHBOR CELL
```

```
BYTE I,NUMV,A
INT ACN,J
NUMV=RAND(4)
FOR I=0 TO 3
DO
A=(NUMV+I)MOD 4
ACN=NGHBR(A) ACN=ADJCELL(CELL,ACN)
IF FISH(ACN)=255 AND
SHARK(ACN)=255 THEN RETURN(ACN)
FI
OD
RETURN(CELL) ;IF NO EMPTY CELLS, RETURNS CURRENT CELL #
```

```
INT FUNC FINDFISH(INT CELL)
;RANDOMLY SELECTS FISH TO EAT
```

```
BYTE I,NUMV,A
INT ACN
NUMV=RAND(4)
FOR I=0 TO 3
DO
A=(NUMV+I)MOD 4
ACN=NGHBR(A) ACN=ADJCELL(CELL,ACN)
IF FISH(ACN)<>255 AND SHARK(ACN)=255 THEN RETURN(ACN)
FI
OD
RETURN(CELL) ;IF NO FISH, RETURNS CURRENT CELL #
```

```
PROC MOVEFISH(INT I)
;RANDOMLY MOVES AND BREEDS FISH
```

```
INT NGHBR,C,R
IF FISH(I)<>255 THEN
NGHBR=FINDMTCELL(I)
IF NGHBR<>I THEN
FISH(NGHBR)=FISH(I)+1
MOVE(NGHBR)=CHRONONS
;TEST TO SEE IF FISH HAS REACHED BREEDING AGE
IF FISH(NGHBR)>=FISHAGE THEN
;BABY FISH IS BORN
FISH(I)=0 FISH(NGHBR)=
RAND(FISHAGE) NUMFISH==+1
;SCALES NUMFISH TO FIT IN 320 COLUMNS
C=(NUMFISH-1)*2/5
;SET UP EQUIVALENT SCALE FOR SHARKS
;(VERTICAL SCALE IS CUT OFF AT 444 SHARKS)
R=NUMSHARK*9/25
IF R>159 THEN R=159
FI
R=159-R
PLOT(C,R)
ELSE FISH(I)=255
FI
FI
RETURN
```



```

PROC MOVESHARK(INT I)
  INT NGHBR,C,R
  IF SHARK(I)<>255 THEN NGHBR=FINDFISH(I)
  IF NGHBR<>I THEN ;FISH AVAILABLE
    SHARKEAT(NGHBR)=0
    SHARK(NGHBR)=SHARK(I)+1
;SEND ONE FISH TO DAVY JONES LOCKER!
    FISH(NGHBR)=255 NUMFISH=-1
    MOVE(NGHBR)=CHRONONS
    IF SHARK(NGHBR)>=SHARKAGE THEN
;BABY SHARK IS BORN
      SHARK(I)=0 SHARKEAT(I)=0
      NUMSHARK==+1 SHARK(NGHBR)=
      RAND(SHARKAGE)
      ELSE SHARK(I)=255
    FI
  ELSE NGHBR=FINDMTCELL(I);NO FISH
    IF NGHBR<>I THEN
      IF SHARKEAT(I)<SHARKSTARVE
      THEN SHARKEAT(NGHBR)=
        SHARKEAT(I)+1
      MOVE(NGHBR)=CHRONONS
      SHARK(NGHBR)=SHARK(I)+1
      IF SHARK(NGHBR)>=SHARKAGE
      AND SHARK(NGHBR)>SHARKEAT(NGHBR)
      THEN NUMSHARK==+1
      SHARK(I)=0 SHARKEAT(I)=0
      SHARK(NGHBR)=RAND(SHARKAGE)
      ELSE SHARK(I)=255
    FI
  ELSE SHARK(I)=255
    NUMSHARK==+1
  FI
  ELSEIF SHARKEAT(I)<SHARKSTARVE
  THEN SHARKEAT(I)==+1
  ELSE SHARK(I)=255 ;SHARK STARVES
    NUMSHARK==+1 ;TO DEATH
  FI
  FI
  C=(NUMFISH-1)*2/5
  R=NUMSHARK*9/25
  IF R>159 THEN R=159
  FI
  R=159-R
  PLOT(C,R)
  FI
RETURN

```

```

PROC MAIN()
  INT I
  INITGR()
  LOADFISH()
  LOADSHARK()
  DO
    POSITION(0,22)
    PRINTF(" CHRONON #ZU",CHRONONS)
    PRINTF(" #FISH=ZU",NUMFISH)
    PRINTF(" #SHARKS=ZUZE",NUMSHARK)
    IF NUMFISH=0 AND NUMSHARK=0 THEN
      STOP=0
    ELSEIF NUMFISH=800 OR NUMSHARK=800
      THEN STOP=0
    FI
    CHRONONS==+1
    FOR I=0 TO 799
      DO
;CHECK TO SEE THAT ONLY ONE MOVE IS MADE PER CHRONON
        IF MOVE(I)<>CHRONONS THEN
          MOVEFISH(I)
          MOVESHARK(I)
        FI
      OD
    UNTIL STOP=0
    OD
  WAIT()
  RETURN

```

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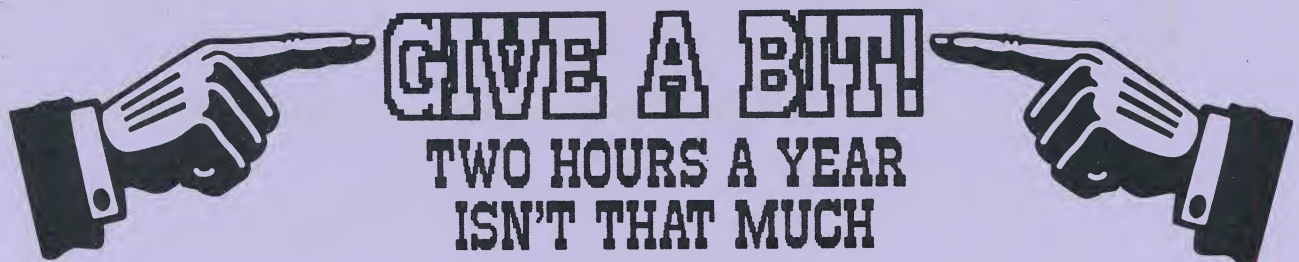
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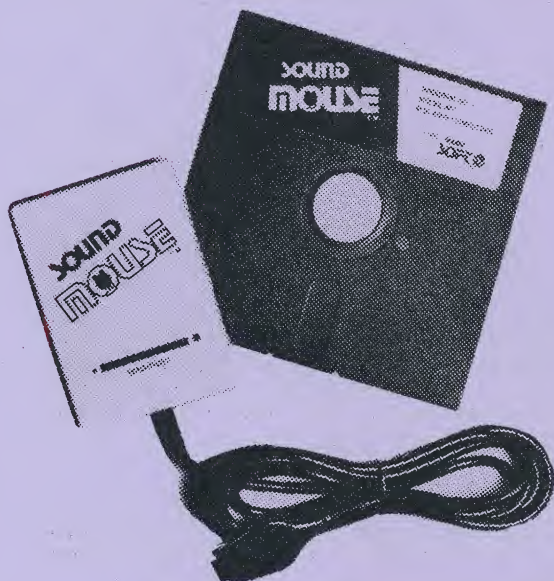
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Box 740, 10 Maple Ave.
Andover, N.J. 07821

by Joseph S. Kennedy

Happy New Year!! Now that you're accustomed to the newer commands in the Atariwriter+ you got for Christmas and you're on the fourth mission for entry into the Halley Project it's time to think about that modem you got your Atari for Christmas. The theme for the January meeting is telecommunications. To telecommunicate you need software to control the modem and what better place to get software than the JACG Disk Library? This month we'll review the telecommunications software in the library.

On disk Volume #007 - Utilities #001 - There are three programs available. First is MODEM, a basic BASIC program that allows you to download programs. UPDLOAD is for the transfer of disk files - both up- and downloading. Again this is a BASIC program. Finally, there is MOD2, which is another basic, no frills, modem controller.

On disk Volume #033 - Utilities #003 - are seven telecommunication programs. The most impressive of these is AMODEM42. This is one of the widely used modem programs for the Atari. It has error checking protocols that are compatible with CPM modem conventions. It is documented by the file AMODEM.DOC which can be dumped to the screen or printer through the DOS "C" command. A second Amodem program is AMODEM48.OBJ. This is a machine language modem controller that is loaded via the DOS "L" command. For those with a Hayes (or Hayes compatible) modem there is AUTODIAL. The name says it all in this case. This BASIC program makes it easy to generate a file containing the proper commands for autodial sequences. UPLOAD.LST allows you to upload a LISTed program with your modem. MODEM is a smart terminal BASIC program that uses two machine language subroutines for sending and receiving information. MODEM3 is another BASIC smart terminal that allows you to download data to disk or printer. Lastly, if you ever downloaded two programs back-to-back on the same file, then SEPARATE is for you. This BASIC program allows you to separate those concatenated files.

Volume #036 - Utilities #004 - has four telecommunication programs. MINIAMIS.BBS allows you set up your own bulletin board system. Use the documentation under MINIAMIS.DOC to get you started then sit back and let everyone call you up and upload their favorite Public Domain programs (no pirates please) to you. JTERM32 is one of the most popular Public Domain modem controllers and was written by Frank Jones. AUTO is the AUTORUN.SYS driver for use with the 850 interface. DIETY will translate machine language files that cannot ordinarily be sent by modem to BASIC data statements that can be sent. It will also translate files received from another DIETY back to machine language files.

Finally on Volume #078 is an update AMODEM program.

I must at this time offer this caveat - I use an Atari XM-301 modem while all the programs above are set-up to work through the 850 interface or its equivalent. A modem program that is not yet in the Disk Library, but most probably will be, is PRO*TERM from the August 1985 issue of ANTIC. This program, written by Matthew Arrington, for the Atari 1030 modem also runs the XM-301 and I would guess any modem that uses the "T:" handler. This program allows you to autodial from memory or to dial from the keyboard. It has a timer clock that you can set to the time of day or use to time your online sessions. For uploading or downloading you can use XMODEM or AMODEM protocol or use a simple file capture. While the program as listed is not set-up to access the 130XE ramdisk a few minor changes to the BASIC program makes it compatible with DOS 2.5.

Well that's it for telecommunication this month. Next month I'll go back to the normal format and include games and educational programs in the PDG review. 'Til next month - Happy Computing.

```
*****
*               *
*      J        *
* GIVE A BIT!!  *
*      C        *
*      G        *
*               *
*****
```

We Get Letters (But we're not sure why)



Vervan Software
10072 Balsa Street
Cucamonga, CA 91730

Mr. Jim Capparelli, Publisher
ANTIC Magazine
524 Second Street
San Francisco, CA 94107
December 3, 1985

Dear Jim,

I recently received a letter from David Marcus who had some comments and complaints about the CT DataManager which I wrote some time back. This is not the first such letter I have received and, until now, I have left the customer support function in the hands of INDOUS Systems who licensed the program from me for use with their Atari disk drive. I am enclosing a clear copy of the BASIC source code for the program with the intent that ANTIC add it to their Public Domain library. Please do so with my blessings. Note that the timing loops in the program will need to be shortened if the program is not going to be compiled.

The primary source of trouble with the CT DataManager is that INDOUS Systems wanted the program compiled. The intent was to avoid having to depend upon Atari BASIC being available. Compiling the program removed that dependency; but it substituted a more severe one in its place. The compiler I used, ABC from Monarch, was designed for the Atari 800 computer. Although I did verify that the program would run on the 1200XL and the 800XL computers, there was no way to guarantee that the compiled version of the CT DataManager would be compatible with any new computers that Atari might release. The "DOS re-booting" problem that David Marcus had when trying to use the 130XE RAM disk is due to the fact that the only way the compiler would allow you to "return" to DOS was via a system Cold Start. If that line in the BASIC program is converted to a simple BASIC "DOS" command, then the problem he was having should go away.

The system crash problem with the initial release of the DataManager program also stems from the ABC compiler. While the ABC compiler was the best on the market at that time, it had some "design deficiencies" that caused it to lose track of what it was doing at times. This feature of the compiler caused spontaneous system crashes. I finally solved the problem by installing some redundant timing loops in the program and recompiling. In both cases, the original BASIC code worked fine.

Cordially,

Carl H. Evans
Carl H. Evans

By Donald Forbes - JACG

Sound

Page 24

draws a straight line. Remove the back slash in DRAW-GRAPH for a curve.

```
0 VARIABLE X 0 VARIABLE Y
0 VARIABLE X1 0 VARIABLE Y1
0 VARIABLE XS 0 VARIABLE YS
0 VARIABLE PI
```

: PLOT-AXES

```
\ plot axes for graphing
3 80 PLOT 316 80 DRAWTO
160 3 PLOT 160 156 DRAWTO
161 3 PLOT 161 156 DRAWTO ;
```

: DRAW-BORDER

```
0 0 PLOT 319 0 DRAWTO
319 159 DRAWTO 0 159 DRAWTO
0 0 DRAWTO 1 0 PLOT
1 159 DRAWTO
318 0 PLOT 318 159 DRAWTO ;
```

: DRAW-GRAPH

```
150 -150 DO I Y1 !
```

\ Next line draws a parabola

```
\ I I * 100 / 70 - Y1 !
( Y1=[X1*X1]/100-70 )
160 I + X !
80 Y1 @ - Y !
( Y @ 3 < OR Y @ 156 > IF )
X @ Y @ PLOT
X @ 1 + Y @ PLOT ( THEN )
LOOP ;
```

: PLOT-A-FUNCTION

```
B GR. 40 YS ! 15 XS !
31416 PI !
```

\ draw border

```
1 COLOR DRAW-BORDER
```

\ plot axes

PLOT-AXES

\ draw graph

DRAW-GRAPH

." Function is "

." function name " ;

Graphics 8 has high resolution, but little color. Colors are created by the electron beam that illuminates combinations of the three colored phosphors that make up each point on the screen. We get different colors by illuminating the even, odd and both dots across the screen--color artifacting takes advantage of the limited resolution of the television screen.

: SIMPLE-ARTIFACTING

```
8 GR. 1 COLOR
." odd even odd and even"
51 1 DO
I 1 PLOT I 150 DRAWTO
2 +LOOP
111 60 DO
I 1 PLOT I 150 DRAWTO
2 +LOOP
171 120 DO
I 1 PLOT I 150 DRAWTO
LOOP ;
```

Another trick is to draw diagonal lines down the screen. The limited resolution of the display causes the line to jog, and alternate colors as it moves from odd to even columns.

: ARTIFACTING \ with diag lines

```
8 GR. 1 COLOR 51 0 DO I 1 PLOT
I 1 + 150 DRAWTO 2 +LOOP
111 60 DO I 1 PLOT
I 2 + 150 DRAWTO 2 +LOOP
171 120 DO I 1 PLOT
I 3 + 150 DRAWTO 2 +LOOP
231 180 DO I 1 PLOT
I 4 + 150 DRAWTO 2 +LOOP
291 240 DO I 1 PLOT
I 5 + 150 DRAWTO 2 +LOOP ;
```

One can create a moire pattern by varying the angle of the diagonals and thus produce some striking and colorful effects. Here is one example.

: GRAPHICS-8-MOIRE-PATTERN

```
8 16 + GR.
320 0 DO 0 0 PLOT
I 159 DRAWTO 4 +LOOP
0 319 DO 319 0 PLOT
I 159 DRAWTO -4 +LOOP
160 0 DO 159 0 PLOT
I I 2 / DRAWTO 4 +LOOP
159 319 DO 159 0 PLOT
I 319 I - 2 / DRAWTO
-4 +LOOP
BEGIN 0 UNTIL ;
```

A flashy demo can be constructed by shifting rapidly between graphics modes.

```
0 VARIABLE X 0 VARIABLE XMAX
0 VARIABLE Y 0 VARIABLE YMAX
0 VARIABLE MODE 0 VARIABLE LL
0 VARIABLE C
0 VARIABLE REGISTER
0 VARIABLE BRITE
: RND# 53770 C@ SWAP /MOD DROP ;
: DELAY 0 DO LOOP ;
: VARY-COLORS \ routine to vary
\ colors and brightness
3 RND# 1 + C !
C @ 1 - REGISTER !
C @ 0= IF 4 REGISTER ! THEN
8 RND# 1+ BRITE !
BRITE @ 2 MOD 0= NOT IF
1 BRITE +! THEN
REGISTER @ 15 RND# BRITE
SETCOLOR C @ COLOR ;
: DRAWING \ drawing subroutine
MODE @ 16 + GR. 2 LL !
X @ LL @ + Y @ LL @ + PLOT
VARY-COLORS
X @ LL @ - Y @ LL @ + DRAWTO
VARY-COLORS
X @ LL @ - Y @ LL @ - DRAWTO
VARY-COLORS
X @ LL @ + Y @ LL @ - DRAWTO
VARY-COLORS
X @ LL @ + Y @ LL @ + DRAWTO
2 LL +! 000 ( ?? ) DELAY ;
: DEMO-FOR-GR-3-5-7
BEGIN
```

```
40 XMAX ! XMAX @ 2 / X !
24 YMAX ! YMAX @ 2 / Y !
3 MODE ! DRAWING
80 XMAX ! XMAX @ 2 / X !
48 YMAX ! YMAX @ 2 / Y !
5 MODE ! DRAWING
160 XMAX ! XMAX @ 2 / X !
96 YMAX ! YMAX @ 2 / Y !
7 MODE ! DRAWING 0 UNTIL ;
```

Graphics 9 will provide 16 shades of any one color--which permits realistic shading of shapes to create a three-dimensional appearance. In this mode COLOR does not select a color register for changing color, but rather a brightness value. Note that all 16 shades are now available, not just the even-numbered ones.

: DELAY 0 DO LOOP ;

: GRAPHICS-NINE-DEMO-ONE

```
9 GR. 4 0 0 SETCOLOR
16 0 DO I COLOR
I 4 * 4 + I 4 * DO
I 10 PLOT I 140 DRAWTO
LOOP LOOP
16 0 DO 4 I 0 SETCOLOR
25000 DELAY LOOP ;
```


This program displays a wall that alternatively gets taller and shorter to simulate the perspective of closer and further away. Continuously varying the shading in each section of the wall will enhance the depth effect.

```

O VARIABLE CC O VARIABLE COL
O VARIABLE NN O VARIABLE XX
O VARIABLE Y1 O VARIABLE Y2
: DELAY O DO LOOP ;
: ROTATE-COLORS
BEGIN 1 CC +! 30000 DELAY
CC @ 15 > IF 1 CC ! THEN
4 CC @ 0 SETCOLOR
O UNTIL ;
: GRAPHICS-NINE-DEMO-TWO
9 GR. O CC ! 1 NN ! O COLOR
4 CC @ 0 SETCOLOR
O XX ! 40 Y1 ! 140 Y2 !
BEGIN
XX @ Y1 @ PLOT XX @ Y2 @ DRAWTO
1 XX +! NN @ MINUS Y1 +!
NN @ Y2 +!
XX @ 16 MOD O = IF
NN @ MINUS NN ! THEN
1 COL +!
COL @ 15 > IF O COL ! THEN
COL @ COLOR
XX @ 79 = IF ROTATE-COLORS THEN
O UNTIL ;

```

Thank you, Dick Kushner! We hope you will be back again with another interesting FORTH demo.



TO BE OR NOT TO BE?
THAT IS THE QUESTION.
IS IT NOBLER TO USE
THE PEN OR MY ATARI?

The Moral 800

Did you see the clip on CNN showing how a man in Georgia programmed his Atari 800 and modem to call the Jerry Falwell toll free fund collecting number every 30 seconds? The purpose of his madness was to prevent the MM from getting tax-free contributions, which the computerist contends is, itself, immoral.

Southern Bell/AT&T traced the call and ordered a cease and desist based on harassment with threat of discontinuance of service. The tv reporter, a typical hollow-eyed beauty, said, "And what is so amazing is that Mr. Jones could use such sophisticated equipment in his own home to carry on such a tactic." Yawn.

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Commercial Sellers Must Advertise

The JACG Executive Committee has adopted the following policy concerning commercial sales at any JACG official meeting. The effective date of implementation will be with the July 14th, 1984 meeting.

1. Any merchant selling or renting products, selling services, or in any way promoting same at JACG club meetings must have an advertisement in the current or previous month's issue of the JACG Newsletter, 1/4 page minimum.

2. The number of merchants shall be restricted to three per meeting unless special permission is granted by the President. Preference will be given to current advertisers.

3. Each merchant will occupy no more than one table space or its equivalent. The JACG does not guarantee availability of tables.

4. Merchants are responsible for the return of all furniture they use to its original location and to leave their area neat and clean before leaving.

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7. Any merchant violating these rules will be not allowed to operate at JACG functions until compliance is assured through the JACG Executive Committee.

8. A merchant is any person, or group of persons, who operate as a regular full or part-time business for the purpose of profit.

The purpose of these operating rules is to insure non-violation of the Bell Laboratories use agreement which, if violated, could jeopardize JACG's use of the facilities. We appreciate your full cooperation in this matter. These rules do not apply to regular members selling their own second hand hardware or original software as outlined in the Flea Market Rules.

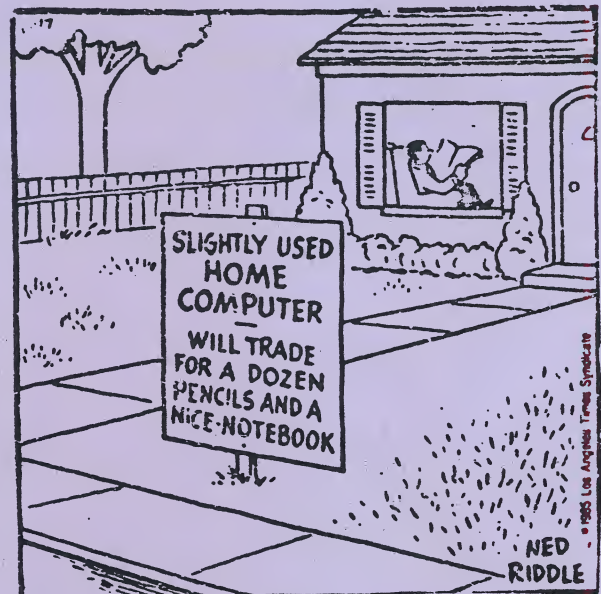
GIVE A BIT!!!

Contribute to the Newsletter this month.

Writing For The JACG Newsletter *****

Articles should be submitted to the Editor by the 20th of the month for inclusion in the next issue. Submissions preferred on disk, using LJK Letter Perfect or Atari Writer. Font style should be Elite or Proportional with right hand justification. If hard copy is submitted the final printed width should be 4-1/4 inches from left margin to right margin. All formats will be considered including hand written documents if first arranged with the Editor.

We want to encourage everyone to voice his/her thoughts, knowledge, and opinions. Writing will be modified at the discretion of the Editor. No piece will be knowingly altered out of original intent.



TRADING POST

Trading Post is a service for JACG members who wish to sell or swap items of any type. There is no charge for this service. Material must reach the Editor by the 20th of the month to be considered for inclusion in the following month's Trading Post. No commercial services or items will be accepted.

>>>>>>>><<<<<<<<

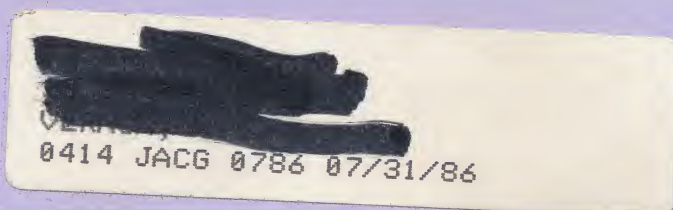
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